

**U.S. Department of the Interior  
National Park Service, Northeast Region  
FINDING OF NO SIGNIFICANT IMPACT  
JAMAICA BAY WILDLIFE REFUGE WEST POND TRAIL BREACH REPAIR**

**Gateway National Recreation Area  
Jamaica Bay Unit  
Jamaica Bay Wildlife Refuge  
Brooklyn and Queens New York**

**INTRODUCTION**

The National Park Service (NPS) prepared an environmental assessment (EA) to evaluate alternatives for repairing a breach in the Jamaica Bay Wildlife Refuge West Pond and West Pond Trail, located in the Jamaica Bay Unit of Gateway National Recreation Area. The project includes restoring and improving the ecological resources, and improving and maintaining a more resilient trail system at West Pond. The project will provide environmentally sensitive and resilient conditions along the West Pond loop trail that support a diversity of Jamaica Bay habitats, wildlife, and enhanced visitor experiences.

The EA evaluated four alternatives: a no-action alternative and three action alternatives and analyzed the potential impacts that these alternatives would have on the natural and human environment. The *Jamaica Bay Wildlife Refuge West Pond Trail Breach Repair Environmental Assessment* (2015) was prepared in accordance with National Environmental Policy Act and its implementing regulations (40 CFR 1500-1508.9); and with NPS Director's Order #12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making* (2011) and accompanying DO-12 Handbook (2001).

During preparation of the EA, the NPS consulted with federal and state agencies, tribes, interested and affected parties, and the general public. The EA was made available for a 30-day review period, during which one public meeting was held. Comments received expressed support for the selected action. No changes were made to the environmental assessment or the selected alternative as a result of these comments; however, some commenters made recommendations for design features that the NPS will take into consideration during the final design stages and implementation of the selected alternative.

**SELECTED ACTION**

The NPS has selected alternative B: Repair the Breach and Improve Habitat Conditions for implementation, with a modification. The selected alternative was identified in the EA as the NPS preferred alternative and is described on pages 22-27 of the EA. As noted in the EA, the NPS has continued to refine the design of the breach repair, resulting in the following change to the selected alternative from what was described in the EA. In the selected alternative, the repair at the primary breach will consist of an earthen embankment over a reinforced timber or fiber-reinforced pile core, with riprap on a portion of the bay side. This change in the design improves the reinforcement measures which increases the resiliency of the pond embankment to extreme weather conditions over the rock embankment of riprap and aggregate mix that was originally described in the EA.

All of the stipulations, mitigation measures and project conditions described as part of the action alternatives on pages 43-47 of the EA will still apply, except as noted below. The text of the EA has been revised to reflect the change from a rock embankment to an earthen embankment as shown in the errata in appendix D. Further refinements are likely to be made as the design is finalized, such as final soil material for the embankment and final materials for the trail surface.

The selected alternative will be implemented in phases, according to the availability of funding. The current, funded phase consists of repairs to the primary and secondary breaches, replacement of the water control structure, and installation of a groundwater well. The future, to-be-funded phases consist of installation of additional visitor amenities, Terrapin Point improvements, and saltmarsh and shoreline restoration on the bay side of the repaired primary breach.

### **Current Phase**

Under the current phase of the selected action, the primary and secondary breaches will be repaired and the water control structure will be replaced. This alternative will establish freshwater conditions within West Pond by installing a freshwater source to supplement natural precipitation and runoff.

*Primary Breach Repair:* The primary beach repair would utilize an earthen embankment overlying a reinforced timber or fiber-reinforced pile core with a surface load transfer platform, with riprap from the toe of the slope to the top of the load platform on the bay side. The reinforced supporting pile core topped with a surface load transfer platform increases the internal strength of the pond embankment and reinforced side slopes in the breached area. Embankment construction to repair the primary breach will occur within approximately 0.35 acres of subtidal channel connecting West Pond with Jamaica Bay.

*Secondary Breach Repair:* Additional measures will be taken to reinforce the secondary breach that has started to form on the banks opposite the primary breached area. The proposed repairs at the secondary breach will consist of placing gabion baskets along the pond-side edge and backfilling the eroded embankments on either side of the trail to tie into the adjacent slope. This work will occur within approximately 0.08 acres of upland, intertidal sand, and emergent wetland. Implementation of the conceptual design in the area of the secondary breach along West Pond will primarily be located above the mean high tide line and most likely above the 5-foot contour. Stabilization efforts may use gabion baskets at the base of the berm. Berm repairs will stop saltwater tidal flow into West Pond. Within the interior of West Pond, revegetation will rely on natural recruitment only and no habitat restoration activities will occur.

*Water Control Structure:* Construction of the new water control structure will occur within an area of approximately 20 feet by 320 feet (6400 ft<sup>2</sup> or 0.15 acre) of intertidal sand and mudflat wetlands in proximity to the existing structure. Maintenance access to the water control structure will extend from the trail to the pond.

*Groundwater well:* A groundwater well will be installed to supply groundwater to supplement natural precipitation and runoff. The well will be installed in compliance with the New York State Water Withdrawal permits, as referenced in Appendix A.

*Construction Access and Trail Repair:* Under phase 1, construction access will take place in up to approximately 4.1 acres of upland area (to include vegetation and trees trimmed within 15 feet of either side of the centerline of the 1.6-mile trail, with clear height of approximately 16 feet to allow construction vehicle access, and a 50 by 50 foot area for vehicle turnaround). Where possible, construction access will be provided on the existing trail. This area will be graded and seeded prior to project completion. During construction, materials and equipment will be staged in the visitor center parking area. Efforts will be made to keep a portion of the parking lot open to visitors who wish to access the visitor center or the East Pond area. To the extent practicable, construction will be scheduled to avoid peak visitation times and, if necessary, construction activity will cease during periods of peak seasonal bird migration.

After repair of the breach, the trail surface at the breach location will be reconstructed to meet federal accessibility standards [Architectural Barriers Act Accessibility Standard (ABAAS)]. Specifically, the contractor will be required to construct the trail surface with 3/8" minus gravel/crusher fines, compacted to create a firm stable trail surface. The repaired trail will be graded from both ends of the repaired breach to meet the existing trail at a 5% grade, or less. Where possible, surfacing material will be selected to lessen noise and minimize wildlife disturbance. Thirteen benches/areas for wildlife viewing will be maintained around West Pond.

### **Future Phases**

*Additional Visitor Amenities:* As part of the conceptual design, potential visitor amenities under future phases may include the following:

- Up to 2,000 linear feet of boardwalk may be installed along the northern border of the pond, extending into the tidal marsh.
- Up to 925 linear feet of boardwalk may be installed along the southern berm, extending into the tidal marsh.
- Up to 250 linear feet of boardwalk and an observation platform may be installed just south of the visitor center, extending into the tidal marsh.
- A 0.3-mile trail around Terrapin Point and up to four observation blinds may be installed in upland areas around Terrapin Point and just north of the visitor center near South Garden.
- Up to three observation platforms may be installed in upland areas on the eastern edge of Terrapin Point and just south of the visitor center.
- Educational/interpretive signs or waysides may be installed to discuss resource protection sensitivities and the need for enforcement to protect wildlife.

*Improvements to Terrapin Point:* Actions to improve habitat conditions at Terrapin Point will include approximately 4.9 acres of upland vegetation restoration, including removal of exotic plants and thinning of the undergrowth. Additionally, about 1.0 acres of shoreline habitat will be restored along the western edge of the point, which will improve terrapin and tern nesting habitat.

*Shoreline Habitat and Saltmarsh Restoration:* Immediately south of the primary breach, approximately 2.7 acres of shoreline habitat will be restored and 5.0 acres of saltmarsh will be restored here and around Terrapin Point. Salt marsh restoration will consist of planting saltmarsh vegetation (for example, saltmarsh cordgrass) similar to the marsh habitat that currently exists to the southeast and southwest of the primary breach area.

Additional resources will be necessary to monitor shoreline habitat restoration. The NPS will lead coordination efforts with volunteers, members of the Student Conservation Association, and partners to assist with management efforts to control invasive vegetation species and conduct resource and berm monitoring. Management strategies will identify measures to treat and/or monitor water quality and the use of a groundwater well.

## **MITIGATION MEASURES**

The selected alternative incorporates the mitigation measures and best management practices listed in appendix A. Additional mitigation measures and best management practices could be added to this list in the future at the discretion of the NPS. Appendix A also includes a list of the permits and approvals that will likely be needed in order to implement the selected alternative.

## **FINDING OF NO SIGNIFICANT IMPACT**

As described in the environmental assessment, the selected alternative has the potential for adverse impacts on water resources, wetlands, vegetation, wildlife and special status species, visitor use and experience and scenic resources, and socioeconomics; however, no potential for significant adverse impacts was identified through the analysis of impacts or the results of agency and tribal consultation or public comment.

As noted in the EA, the alternatives were described at the conceptual/schematic design level, with further refinement expected. As described in Selected Action above, the design for the primary breach repair has evolved from a riprap embankment over a riprap and aggregate core to an earthen embankment over reinforced timber or fiber-reinforced pile core with riprap toe on the bay side of the slope which increases the resiliency of the pond embankment to extreme weather conditions such as high wind speeds, increased water pressure and erosive shear forces from storm events. Although the design has been revised, the resulting embankment will remain within the footprint analyzed in the EA. The only difference in impacts is that there may be some disturbance to marine life from the noise of driving the piles, which would be minimized by implementing a noise mitigation plan, as described in Appendix A, so that such impacts are expected to be minimal. All other impacts are expected to be the same, or slightly less, than what was described in the EA.

Slight adverse impacts to sediments and soils, water resources, wetlands, and vegetation are expected to occur because of ground disturbance during construction and construction access to the various work sites. These impacts are expected to be minimal because of the limited period of construction, the small areas of disturbance, and the implementation of best management practices (see appendix D). While seasonal drawdowns of the pond through the water control structure could have an adverse impact on water quality near the water outfall, these impacts are expected to be negligible because the NPS will develop management strategies to address these releases and ensure the letdown rates are compatible with the flushing rates and tidal cycles to the extent practicable.

Long-term benefits are expected for these resources as active water control management will flush nutrients and contaminants from the pond, improving wetland function and habitat over current conditions.

Adverse impacts to populations of wildlife and special status species during construction are expected to be minimal due to the limited number of individuals affected, the availability of suitable adjacent habitat and the short duration of construction. The switch from estuarine (saline) to palustrine (freshwater) conditions within West Pond will have limited adverse impacts to wildlife individuals (including fish, birds, small mammals, etc.) that depend on estuarine conditions by creating inhospitable habitat; however, impacts to the larger population will be minimal because the surrounding estuary of Jamaica Bay provides a large amount of suitable estuarine habitat, both for the larger wildlife populations and those displaced individuals that relocate to it. While there will be adverse effects to essential fish habitat from the in-water noise and turbidity from disturbance of soft bottom substrates from construction, these are expected to be minimal, localized to the area of construction, and temporary to the timeframe of construction activities. Habitat restoration activities will have long-term beneficial impacts on wildlife because these activities will result in improvements to habitat quality and quantity in an area that has a history of degradation and habitat loss.

While there may be adverse impacts to visitor experience and the socioeconomics of the local community during construction, particularly during any closures of the refuge, they are expected to be temporary and limited.

Other past, present, or reasonably foreseeable actions were analyzed for their potential to contribute to cumulative impacts in association with implementation of the selected alternative. The effects of the selected alternative will comprise a very small component of any cumulative impacts, given the size and scope of the Jamaica Bay ecosystem. Overall, the impacts of the selected alternative, combined with the cumulative beneficial and adverse impacts from other past, present, and reasonably foreseeable future actions, will not result in significant adverse cumulative impacts.

In summary, the selected alternative will not have a significant effect on the human environment. There are no significant impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the NPS selected alternative will not violate any federal, state, or local environmental protection law.

Based on the foregoing, it has been determined that an environmental impact statement is not required for this action and thus will not be prepared.

## **DECISION REACHED AND RATIONALE**

The NPS has selected alternative B: Repair the Breach and Improve Habitat Conditions, the NPS Preferred Alternative, for implementation as described in this Finding of No Significant Impact.

Repairing the primary breach in West Pond and installing a freshwater source through a groundwater well will allow the NPS to return West Pond to more freshwater conditions and provide a diversity of habitats for wildlife, unusual in an urban area.

Replacement-in-kind of the water control structure will provide NPS with additional capacity to manage water and salinity levels through occasional drawdowns for purposes of resident and migratory wildlife management at West Pond.

The selected action will improve the visitor experience markedly over current conditions through trail restoration and additional opportunities for wildlife viewing, education, and outreach. The 1.6 mile trail around West Pond that existed before Hurricane Sandy will be restored, allowing visitors a continuous loop and easier access around the pond and to various viewing locations. In future phases of the project, additional wildlife viewing areas and boardwalks will be strategically placed around West Pond to enhance the visitor experience. The expanded diversity of habitat that will be achieved through re-establishment of freshwater habitat is expected to increase the number of wildlife species, particularly birds, that frequent West Pond, and that expansion will improve the visitor experience, particularly for birdwatchers. The proposed future visitor amenities will further enhance opportunities for outreach and education at the refuge.

Once the selected action is fully implemented, shoreline and saltmarsh restoration will create a breakwater to attenuate tidal wave action, increase the resiliency of the repaired berm, and reinforce the breached area so that it can accommodate periodic overflow. In addition, the eventual natural regeneration of wetlands and vegetation within the interior of West Pond will absorb interior wave action and provide additional protection to the repaired berm. A water control structure will also give the NPS some ability to control water levels to aid recovery from storm events that might inundate the pond. Installation of a groundwater well will give NPS staff additional capacity to manage water and salinity levels within West Pond both seasonally and in response to future storm events.

For these reasons and in consideration of the likely environmental impacts described in this Finding of No Significant Impact, I have decided to select Alternative B for implementation.

Recommended:  2.1.2016  
Jennifer T. Nersesian, Superintendent Date  
Gateway National Recreation Area

Approved:  2/8/16  
Michael A. Caldwell, Regional Director Date  
Northeast Region, National Park Service

- Appendix A Mitigation Measures and Permits and Approvals Needed
- Appendix B Agency and Tribal Consultation
- Appendix C Public Involvement and Comments Received on the EA
- Appendix D Errata Sheet
- Appendix E Non-Impairment Determination
- Appendix F Final Wetland Statement of Findings
- Appendix G Final Floodplain Statement of Findings

## **APPENDIX A**

### **MITIGATION MEASURES AND PERMITS AND APPROVALS NEEDED**

To prevent and minimize potential adverse impacts associated with the action alternatives, best management practices and mitigation measures will be implemented during the construction and post construction phases of the project. General and resource specific best management practices and mitigation measures are listed below by impact topic. This list provides a framework for mitigation measures that will be included in the contractor's specifications; future mitigation measures could be added to this list at the discretion of the NPS. Furthermore, the state and federal permits that will be required before this project proceeds with construction will likely include a variety of conditions specifically related to the protection of water quality and natural resources from additional construction-related impacts. A list of expected permits is included at the end of this appendix.

Various best management practices will be adopted as part of the selected alternative and will be incorporated into design plans and specifications, providing a contractual requirement that any contractor retained for any phase of the action will abide by the conditions and procedures identified in this document and permits. Those typical mitigation measures that could be applied are described below. Mitigation measures will be refined as the design of the project develops and as permit conditions are defined by the regulatory agencies.

#### **GENERAL**

- A contractor kickoff meeting will be held to ensure that all workers are apprised of proper protocol to follow in the event of an emergency, including contact information for first responders.
- The contractor will not leave vehicles idling for extended periods when parked or not in use.
- Stockpile materials will be placed in the construction staging areas within the West Pond visitor center parking lot to avoid impacting natural features unnecessarily.
- Construction equipment will be restricted to paved or previously disturbed compacted surfaces where practicable to avoid impacts on natural resources, including wetland areas. If construction equipment must be used or staged off such surfaces, best management practices, such as those described in the sections below, will be implemented to minimize potential for adverse impacts.
- Temporary advanced warning signs will be installed to warn of closures during construction.

## NATURAL RESOURCES

- Construction will strive to avoid estuarine areas during horseshoe crab spawning season (May through late June) to protect horseshoe crabs, ensure recruitment, and avoid disruption of red-knot foraging activity. The critical feeding time for the red knot in Jamaica Bay is typically in late May.
- Based on the seasonal presence of the essential fish habitat species, the optimal time for construction and other water disturbing activities is during winter to avoid delicate life stages of the fish. However, it does not benefit the habitat to prolong the project to accommodate this window and winter construction may not be practicable.
- Access to nesting areas will be limited during certain times of the year to provide for species protection, as appropriate.
- Areas disturbed from and/or during construction will be kept as small as possible to minimize exposed soils and the potential for erosion.
- Any exposed soils or fill material will be permanently stabilized at the earliest practicable date.
- During construction, every effort will be made to appropriately use adjacent excavated soils if the fill source is appropriate. However, sources and types of fill will be dependent on final project design. Sources of fill will be obtained in accordance with agency approvals and permitting requirements and fill will be certified free of exotic invasive vegetation species or weed free.
- Any vegetation lost during the construction process will be mitigated with the planting of native species. Exotic species lost will be replaced with native species as mediation for loss of mature growth. A native species planting list and plan will be approved by the NPS before planting.
- Measures will be implemented to prevent the spread or introduction of invasive vegetation, such as ensuring that construction-related equipment arrives at the site free of mud or seed-bearing materials and certifying that any seeds or straw material are weed free. Tools and machinery will be thoroughly cleaned when moving from an area heavily covered with invasive vegetation, to an area without invasive vegetation. The tires or tracks of trucks and equipment entering and leaving project sites will be washed off to prevent seed transport.
- Construction will be mindful to avoid/minimize impacts to migrating and nesting birds between April 1 and October 31.
- Temporary construction fences will be installed to identify areas that require clearing, grading, revegetation, or recontouring and to delimit work areas. Installation of fences will be required before site preparation work or earthwork begins.
- As appropriate, erosion control measures will be implemented to prevent sediment from entering surface waters, including the use of silt fences or fiber rolls to trap sediments.
- Volatile wastes and oils will be disposed of in approved containers for removal from the project site to avoid contamination of soils, drainages, and watercourses.

- Care will be taken to avoid any rutting by vehicles or equipment. The operation and movement of construction equipment will be restricted to defined work areas.
- A pocket guide of the special status species will be kept on site and will include pictures and identification guides for the restoration crew to refer to when or if they encounter potential sign of special status species. This guide will also include names and radio numbers on whom to contact if a positive identification were made.
- The crew will be briefed about special status species and showed a PowerPoint presentation about what to be on the lookout for. This will include any contractors or national recreation area staff working on the project.

## **CULTURAL RESOURCES**

- The NPS will ensure that all personnel would be instructed on procedures to follow in case previously unidentified archeological resources were uncovered during construction. Should construction unearth previously undiscovered archeological resources, work will cease in the area of any discovery and the national recreation area's cultural resources specialist will be contacted. Consultation with the New York State Historic Preservation Officer will be conducted, in accordance with 36 CFR§ 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) will be followed.

## **SPILL PREVENTION AND RESPONSE PLAN**

A spill prevention and response plan that regulates the use of hazardous and toxic materials, such as fuels and lubricants for construction equipment will be prepared. The NPS will oversee implementing the spill prevention and response plan. Elements of the plan will include the following:

- Workers will be trained to avoid and manage spills.
- Construction and maintenance materials will be prevented from entering surface waters and groundwater.
- Green (biodegradable) hydraulic fluids and oils will be used on mechanical equipment.
- A spill kit with boom and sorbent materials will be on site at all times during construction.
- Spills will be cleaned up immediately and appropriate agencies will be notified of spills and of the cleanup procedures employed.
- Staging and storage areas for equipment, materials, fuels, lubricants, solvents, and other possible contaminants will be located at least 100 feet away from surface waters.
- No vehicles will be fueled, lubricated, or otherwise serviced within 200 feet of the normal high water area of any surface water body.
- Vehicles will be immediately removed from work areas if they are leaking.

## **MEASURES TO PROTECT AIR QUALITY**

- Vehicle emissions controls will be implemented, such as keeping equipment properly tuned and maintained in accordance with manufacturers' specifications and implementing best management construction practices to avoid unnecessary emissions (e.g., engines will not idle for extended periods of time).
- To the degree possible, best management practices will be used to reduce generation of dust, such as covering loose soil, use of preapproved organic dust palliatives, and/or watering activities.

## **MEASURES TO PROTECT WATER RESOURCES, WETLANDS, AND FLOODPLAINS**

In accordance with NPS Procedural Manual #77-1: Wetland Protection, the following best management practices and special conditions will be implemented.

- Specific provisions will be identified in the construction contract(s) to prevent stormwater pollution during construction activities, in accordance with the National Pollutant Discharge Elimination System permit program of the Clean Water Act and all other federal regulations, and in accordance with the stormwater pollution prevention plan to be prepared for this project.
- Buffers between areas of soil disturbance and waterways will be planned and maintained. Soil erosion best management practices will be used such as sediment traps, erosion check screen filters, and hydro mulch to prevent the entry of sediment into waterways.
- Any hazardous waste that is generated in the project area will be promptly removed and properly disposed of.
- Onsite fueling and maintenance will be minimized. If these activities cannot be avoided, fuels and other fluids will be stored in a restricted/designated area and fueling and maintenance will be performed in designated areas that are bermed and lined to contain spills.
- Actions will be taken to minimize effects on site hydrology and fluvial processes, including flow, circulation, water level fluctuations, and sediment transport. Care will be taken to avoid any rutting caused by vehicles or equipment.
- Actions will be conducted to minimize adverse effects on normal movement, migration, reproduction, or health of terrestrial fauna, including at low flow conditions.
- Actions will be conducted so as to minimize effects on site hydrology and fluvial processes, including flow, circulation, velocities, hydroperiods, water level fluctuations, sediment transport, and channel morphology. Care will be taken to avoid any rutting caused by vehicles or equipment.
- Best management practices will be properly followed during the installation of any supplemental surface water supply system.

- Any necessary structure or fill will be properly maintained so as to avoid adverse impacts on aquatic environments or public safety.
- Heavy equipment use in wetlands will be avoided if at all possible. Heavy equipment used in wetlands will be placed on mats, or other measures will be taken to minimize soil and plant root disturbance and to preserve preconstruction elevations.
- Whenever possible, excavated material will be placed on an upland site. However, when this is not feasible, temporary stockpiling of excavated material in wetlands will be placed on filter cloth, mats, or some other semipermeable surface, or comparable measures will be taken to ensure that underlying wetland habitat is protected. The material will be stabilized with straw bales, filter cloth, or other appropriate means to prevent reentry into the waterway or wetland.
- Temporary stockpiles in wetlands will be removed in their entirety as soon as practicable. Wetland areas temporarily disturbed by stockpiling or other activities during construction will be returned to their preexisting elevations, and soil, hydrology, and native vegetation communities will be restored as soon as practicable.
- Revegetation of disturbed soil areas will be facilitated by salvaging and storing existing topsoil and reusing it in restoration efforts in accordance with NPS policies and guidance. Topsoil storage will be for as short a time as possible to prevent loss of seed and root viability, loss of organic matter, and degradation of the soil microbial community.
- Where plantings or seeding are required, native plant material will be obtained and used in accordance with NPS policies and guidance. Management techniques will be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species.
- Minimizing shade impacts, to the extent practicable, will be a consideration in designing boardwalks and similar structures. (Placing a boardwalk at an elevation above the vegetation surface at least equal to the width of the boardwalk will be one way to minimize shading.)
- Actions will be consistent, to the maximum extent practicable, with state coastal zone management programs.
- Actions will not jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, including degradation of critical habitat.

#### **MEASURE TO ADDRESS VISITOR USE**

- Information on upcoming closures, including closure dates and arrangements for alternate trail access points, will be posted on the national recreation area website, distributed at other visitor centers within the national recreation area, and posted at the project site. Information on alternate opportunities for visitor use will be publicized on the national recreation area website, in the national recreation area newsletter, and in signage at the trailheads when closures are necessary.

## **MEASURE TO ADDRESS NOISE**

- The contractor will create and implement a noise reduction plan. The contractor may elect any combination of legal, non-polluting methods to maintain or reduce noise to threshold levels or lower. The plan for attenuating construction-related noises will be implemented prior to the initiation of any work. The noise reduction plan will be reviewed and approved by the National Park Service. The noise reduction plan shall include a monitoring methodology to include the protection of marine species from the potential impacts of construction noise.

## **PERMITS AND APPROVALS NEEDED**

### **Federal Permits**

- Section 404 of the Clean Water Act
- Section 10 of the Rivers and Harbors Act

### **State and Local Permits**

- Section 401 Water Quality Certification
- New York State Tidal Wetlands Permit
- New York State Water Withdrawal Permit

Additional permits may be required as the breach and trail repair and future phases are implemented.

## **APPENDIX B**

### **AGENCY AND TRIBAL CONSULTATION**

#### **Section 7 of the Endangered Species Act**

The NPS reviewed species data for the project area through the U.S. Fish and Wildlife Information, Planning and Conservation System. Subsequently, in a letter sent in March 2014, the NPS initiated informal consultation with the U.S. Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act regarding potential impacts of the project on federally listed threatened or endangered species. Based on information gathered during scoping and a review of the U.S. Fish and Wildlife Service Information, Planning and Conservation website, three federally listed species were identified as potentially present within the project area: seabeach amaranth (*Amaranthus pumilus*), piping plover (*Charadrius melodus*), and roseate tern (*Sterna dougallii dougallii*). However, the last recorded occurrence of the seabeach amaranth and piping plover within the project area was decades ago; therefore, they were not considered in the analysis. The northern long-eared bat (*Myotis septentrionalis*) and the red knot (*Calidris canutus ssp. rufa*) were listed during development of this document and were, therefore, added to the analysis. Pursuant to the Endangered Species Act, the NPS made a finding that the preferred alternative may affect but is not likely to adversely affect the red knot and roseate tern, and will have no effect on the northern long-eared bat. The U.S. Fish and Wildlife Service concurred with that finding on February 1, 2016. The NPS will continue to coordinate with the U.S. Fish and Wildlife Service with regard to a monitoring plan for listed species.

#### **Section 106 of the National Historic Preservation Act**

The NPS has consulted with the New York State Historic Preservation Officer on effects to historic properties in accordance with Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's regulations (36 CFR 800). In 2014, the park completed a historic resources survey at the West Pond project area. This survey concluded that the portion of the refuge on Rulers Bar Hassock, including East and West Ponds, was not eligible for listing on the National Register of Historic Places. A copy of the historic resources survey was sent to the New York State Historic Preservation Officer, who concurred with the findings in a letter dated September 18, 2014.

On October 6, 2015, the NPS submitted the project to the New York State Historic Preservation Officer with a determination of "no historic properties affected." The State Historic Preservation Officer concurred with that determination in a letter dated October 15, 2015.

#### **Consultation with Tribes**

The NPS consulted with the Delaware Nation, the Delaware Tribe, and the Stockbridge-Munsee Mohican Tribe. The Stockbridge-Munsee Mohican Tribe responded that they did not have significant cultural resource concerns with the project due to the lack of known sites and the limited potential for intact resources. The Delaware Nation and Delaware tribes have not responded to the NPS to indicate interest in this project.

## **Coastal Zone Management Act, Federal Consistency Determination**

As defined by the Coastal Zone Management Act, federal actions subject to the enforceable policies of approved state management programs are any actions that (1) cause changes in the manner in which land, water, or other coastal zone natural resources are used, (2) cause limitations on the range of uses of coastal zone natural resources, or (3) cause changes in the quality or quantity of coastal zone natural resources. New York's coastal zone extends seaward from the mean high tide line to 3 nautical miles offshore and includes the project area. The NPS prepared a federal consistency determination that demonstrates compliance with the provisions of New York's Coastal Management Program (44 enforceable policies) and the New Waterfront Revitalization Program (10 policies) prepared under the Coastal Zone Management Act. The federal consistency determination was provided to the New York Department of State for review and concurrence, and on November 30, 2015, the State of New York Department of State, Office of Planning and Development responded in concurrence with the NPS consistency determination.

## **Magnuson-Stevens Fishery Conservation and Management Act**

Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act directs federal agencies to consult with the National Marine Fisheries Service on all actions or proposed actions that may adversely affect essential fish habitat. Adverse effects to essential fish habitat, as defined by the National Marine Fisheries Service, are those that may result from actions occurring within or outside the essential fish habitat, and may include site-specific or essential fish habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires the National Marine Fisheries Service to recommend measures that may be taken by the action agency to conserve essential fish habitat.

In compliance with section 305 and its implementing regulations (50 CFR Part 600), the NPS submitted the environmental assessment for the project to the National Marine Fisheries Service with a finding of no more than a minimal impact (de minimis impacts) on habitats designated as essential fish habitat. In their response dated November 4, 2015, the National Marine Fisheries Service stated that although "West Pond is currently tidally influenced due to the breach and is considered EFH [essential fish habitat], we recognize that its previous condition as a freshwater wetland complex provided habitat supporting species diversity and a productive ecosystem. This diversity helps to support the visitor, education, and recreational missions of the refuge. The resiliency of all of the surrounding habitats, including the EFH [essential fish habitat], will benefit from the restoration of the breached berm of West Pond." National Marine Fisheries Service agreed with the findings that the proposed best management practices of using turbidity curtains and other methods would further reduce the adverse effects to essential fish habitat. In addition, they concurred that removing fill and planting in the spring when growing conditions are favorable will enhance and restore essential fish habitat for a number of federally managed species including summer flounder, bluefish, and their prey species.

Because the exact design of the wetlands and the operational procedures for freshwater releases are not fully developed at this time, the NPS will continue to work with National Marine Fisheries Service as project plans for habitat enhancement are finalized to minimize any temporary or long-term impacts to essential fish habitat that may occur during construction.

**NPS Director's Order #77-1: Wetland Protection, and Director's Order #77-2: Floodplain Management**

Pursuant to NPS Director's Order #77-1: Wetland Protection (2002) and accompanying Procedural Manual #77-1: Wetland Protection (2012), a Draft Wetland Statement of Findings was prepared and circulated with the EA. The Draft Wetland Statement of Findings summarizes the wetland delineation and functional analysis used to assess wetlands functions at West Pond. The Draft Wetland Statement of Findings also describes how the use and modification of wetlands in the project area are essential for fulfilling the mission of the refuge and will increase functional values of essential wetlands functions. No comments were received on the Draft Wetland Statement of Findings and no changes have been made. A Final Wetland Statement of Findings is attached as appendix F.

Pursuant to NPS Director's Order #77-2: Floodplain Management (2003) and accompanying Procedural Manual #77-2 (2003), a Draft Floodplain Statement of Findings was prepared and circulated with the EA. The Draft Floodplain Statement of Findings summarizes the floodplain development associated with actions to repair the primary and secondary breaches in the West Pond berm and restore freshwater habitat in West Pond. The Draft Floodplain Statement of Findings also describes the reasons why encroachment into the floodplain is required to implement the project, the site-specific flood risks involved, and the measures that will be taken to mitigate floodplain impacts. No comments were received on the Draft Floodplain Statement of Findings and no changes have been made. A Final Floodplain Statement of Findings is attached as appendix G.

**APPENDIX C**  
**PUBLIC INVOLVEMENT AND COMMENTS RECEIVED**

The interested public and agencies were provided an opportunity to review and comment on the environmental assessment during a 30-day review period from October 6, 2015, through November 6, 2015. Availability of the environmental assessment was announced on the NPS Planning, Environment and Public Comment (PEPC) website and through a press release, which was published on September 28, 2015. In addition, an open house public meeting was held at the Jamaica Bay Wildlife Refuge Visitor Center in Queens, New York on October 22, 2015. A total of 122 correspondences were received during the public comment period. The vast majority of comments expressed support for the preferred alternative. Some commenters provided recommendations for design features that the NPS will take into consideration during the final design stages and implementation of the selected alternative.

## APPENDIX D ERRATA

This errata sheet documents changes to the text of the EA as a result of design changes subsequent to the document being released to the public on October 6, 2015. Changes to the EA text are below and are noted by page number.

### Errata

#### *Cover page*

The title is revised from “West Pond Environmental Assessment” to “Jamaica Bay Wildlife Refuge West Pond Trail Breach Repair Environmental Assessment.”

#### *Summary page*

The title of the EA is revised from “West Pond Environmental Assessment” to “Jamaica Bay Wildlife Refuge West Pond Trail Breach Repair Environmental Assessment.”

*The following text is revised on page 22 of the EA:*

The primary breach would be repaired utilizing **an earthen embankment overlying a reinforced timber or fiber-reinforced pile core with a surface load transfer platform, with riprap from the toe of the slope to the top of the load platform on the bay side. The reinforced supporting pile core topped with a surface load transfer platform increases the internal strength of the pond embankment and reinforced side slopes in the breached area.** Embankment construction to repair the primary breach would occur....

*Figure 5 on page 27 of the EA is revised to reflect the following changes:*

The water control structure was incorrectly indicated at the location of the secondary breach on the west side of the pond. The existing water control structure is located just south of the three benches (three blue dots) to the north of the secondary breach.

*The following text is added to page 47 of the EA:*

## **MEASURE TO ADDRESS NOISE**

- The contractor will create and implement a noise reduction plan. The contractor may elect any combination of legal, non-polluting methods to maintain or reduce noise to threshold levels or lower. The plan for attenuating construction-related noises will be implemented prior to the initiation of any work. The noise reduction plan will be reviewed and approved by the National Park Service. The noise reduction plan shall include a monitoring methodology to include the protection of marine species from the potential impacts of construction noise.

In addition to documenting these changes to the EA in errata, the EA with these changes has been posted to the NPS PEPC web site.

## **APPENDIX E**

### **NON-IMPAIRMENT DETERMINATION**

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of Interior and the NPS to manage units “to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations” (16 USC § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 USC 1a-1).

NPS Management Policies 2006, Section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The NPS has discretion to allow impacts on Park resources and values when necessary and appropriate to fulfill the purposes of a Park (NPS 2006 sec. 1.4.3). However, the National Park Service cannot allow an adverse impact that would constitute impairment of the affected resources and values (NPS 2006 sec 1.4.3). An action constitutes an impairment when its impacts “harm the integrity of Park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006 sec 1.4.5). To determine impairment, the National Park Service must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006 sec 1.4.5).

This determination on impairment has been prepared for the selected alternative described in this finding of no significant impact. An impairment determination is made for all resource impact topics analyzed for the selected alternative. An impairment determination is not made for visitor experience and scenic resources and socioeconomics because impairment findings relate back to park resources and values, and these impact areas are not generally considered to be park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

## **SOILS AND SEDIMENTS**

The NPS selected alternative will have adverse impacts on soils and sediments during implementation. These impacts will be primarily related to construction activities and earthmoving equipment under phase 1 and future phases of the selected action. The NPS selected alternative will contribute a slight beneficial increment to the overall substantially adverse cumulative impact on soils and sediments.

The NPS selected alternative will not result in impairment of soils and sediments because, due to the localized nature of the construction activities, the use of best management practices, and soil stabilizing revegetation efforts, long-term adverse consequences to soils and sediments are not expected to result from construction activities associated with implementation of the selected action. In addition, over the long-term, repairing the breaches and stabilizing the banks will provide slightly beneficial impacts to soils and sediments by reducing the increased pressure from storm surge and improving the success of reestablished soil-stabilizing vegetation. The redesignation of the loop trail will localize soil impacts to the trail and further reduce erosion and future habitat restoration activities will contribute largely beneficial long-term impacts to soils and sediments because of the increased soils and sediment stabilization these efforts will afford.

## **WATER RESOURCES**

The NPS selected alternative will have temporary construction-related adverse impacts to water resources from disturbances and increased sedimentation during construction activities. Freshwater replenishment by a groundwater well will have no adverse impacts on water resources because there will be no long-term impacts associated with construction activities or the available volume of water. Seasonal drawdowns through the water control structure could have an adverse impact on water quality outside the water outfall, but it is expected to be negligible because the NPS will develop management strategies to address these seasonal freshwater releases to ensure the letdown rates are compatible with the flushing rates and tidal cycles to the extent practicable. Installation of a water control structure will provide additional capacity for national recreation area staff to manage water and salinity levels for purposes of wildlife management, resulting in improved water quality conditions for wildlife. The selected action will contribute a beneficial increment to the overall substantially adverse cumulative impact.

The NPS selected action will not result in impairment of water resources because there will be no long-term adverse impacts to water resources. Once the transition to freshwater conditions within West Pond is complete and wetland and vegetation conditions stabilize, impacts on West Pond water resources will be beneficial. Restoring shoreline habitat and saltmarsh under future phases will attenuate wave action and storm surges, which will control erosion and sedimentation in the water column. The shoreline habitat restoration will also function to trap sediments to aid in the accretion process to further improve water quality.

## **WETLANDS AND FLOODPLAINS**

The NPS selected alternative will have slight, adverse impacts to wetlands and floodplains during construction because approximately 0.35 acres of tidal conveyance and 0.08 acres of upland, intertidal sand, and emergent wetland will be filled at the primary and secondary breach, respectively. Long-term consequences to wetlands are not expected to result from the installation of the water control structure or a groundwater supply well due to the use of best management practices and avoidance of wetland and seasonally flooded areas during site selection and construction. Under future phases, installation of amenities will have temporary but recoverable slight adverse construction impacts and minimal loss of wetland habitat due to shading. The selected alternative will contribute a minimally beneficial increment to the overall substantially adverse cumulative impact because of the substantial influence from previous development and pollution.

The NPS selected action will not result in impairment of wetlands and floodplains because adverse impacts during construction activities will be temporary, limited to the time of construction, guided by best management practices, and localized to a relatively small area compared to the surrounding Jamaica Bay estuary. Over the long-term, repairing the West Pond breaches and reestablishing freshwater wetlands will provide beneficial wetland impacts because of the important role freshwater wetland functions and values have in the region. Impacts to floodplains will be beneficial because once the berm is repaired and the banks were stabilized it will provide protection from storm surges, decrease fetch, and better protect facilities and resources. Once the restoration is completed and the area is stabilized, moderately beneficial effects will occur because there will be an increase (5 acres) in the amount of high saltmarsh along the West Pond area. The location outside of the repaired berm will protect marsh vegetation by decreasing fetch and decreasing exposure and intensity of storm surges, and there will be an increase in quantity and quality of freshwater and saltmarsh functions and values and floodplain values of West Pond and environs.

## **VEGETATION**

The NPS selected alternative will have adverse impacts to vegetation during construction. These impacts will primarily be associated with construction equipment that will impact vegetation at several locations around West Pond. These impacts will include uplands (approximately 7.3 acres) along the perimeters of the loop trail; approximately 0.08 acres of upland, intertidal sand, emergent wetland at the secondary breach location; 1.6 miles of trail that will be cleared of vegetation to accommodate construction equipment; trees along the trail that will be trimmed to accommodate construction equipment; and two 50 square foot areas that will be cleared of vegetation for construction vehicle turnarounds. The selected alternative will contribute a minimally beneficial increment to the overall substantially adverse cumulative impact.

The NPS selected action will not result in impairment of vegetation because overall, moderately beneficial effects will occur as a result of habitat restoration activities that will take place under future phases, which will provide improvements on vegetation in an area that has a history of degradation and habitat loss. Vegetation communities will benefit from the storm protection and buffering qualities of these improvements in habitat quality and quantity once the structure and function of these areas are established.

Due to best management practices that will be in place, the localized nature of the construction activities, and the recoverability after disturbance due to revegetation efforts, long-term consequences to vegetation as a result of construction impacts are not expected. In addition, management of the hydrology and salinity of the pond will have beneficial impacts for vegetation because it will allow for the recruitment of particular freshwater vegetation that is unique to the region.

## **WILDLIFE AND SPECIAL STATUS SPECIES**

The NPS selected alternative will have adverse and beneficial impacts to wildlife and special status species. These impacts will be associated with temporary disturbances during construction. In addition, as West Pond converts to a freshwater ecosystem, there will be minimally adverse impacts to wildlife individuals that do not rely on freshwater habitats. Because of the recoverability of construction impacts, the localized nature of the impact, the short duration of the construction period, and the availability of suitable adjacent habitat for retreat, impacts from construction will be minimal and long-term consequences to populations of wildlife and special status species are not expected. There may be beneficial impacts for the red knot and the roseate tern because of restoration efforts under future phases. There will not be any impacts to the northern long-eared bat because habitat for this species is not likely to occur at the site. State-listed passerine species will likely benefit over time because upland habitat conditions will improve. The selected alternative will contribute a slightly beneficial increment to the overall substantially adverse cumulative impact.

The NPS selected action will not result in impairment of wildlife and special status species because overall, long-term impacts to wildlife from the restoration of a freshwater ecosystem will be beneficial and implementation of the selected action will not jeopardize the continued existence of any species. The ability to manage water levels with a water control structure will allow NPS staff to improve water quality by seasonally exposing mudflats for foraging by migrating shorebirds and waders along the perimeter of the pond, which will result in beneficial impacts for wildlife. Habitat restoration activities will result in improvements to habitat quality and quantity, in an area that has a history of degradation and habitat loss, once the structure and function of these areas are established.

**APPENDIX F**

**FINAL WETLAND STATEMENT OF FINDINGS**

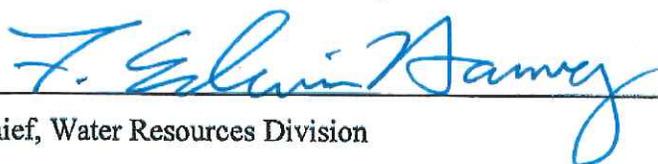
FINAL WETLAND STATEMENT OF FINDINGS

Jamaica Bay Wildlife Refuge West Pond Trail Breach Repair  
Gateway National Recreation Area  
Jamaica Bay Unit  
Jamaica Bay Wildlife Refuge

**Recommended:**

  
\_\_\_\_\_  
Jennifer T. Nersesian, Superintendent, Gateway National Recreation Area      Date 1-15-16

**Certified for Technical Accuracy and Servicewide Consistency:**

  
\_\_\_\_\_  
Chief, Water Resources Division      Date 1/21/2016

**Approved:**

  
\_\_\_\_\_  
Michael A. Caldwell, Regional Director, Northeast Region      Date 2/8/16

## **INTRODUCTION**

Jamaica Bay is one of the largest coastal wetland ecosystems in the region and is part of a series of tidal estuaries extending along the Atlantic coast. The rich biodiversity that characterizes the Jamaica Bay ecosystem is derived from a mosaic of estuarine features--open water, mud flats, low and high saltmarshes and intertidal beaches with freshwater wetlands in adjacent upland habitats. These wetlands are interfaces between the open water and land, and serve many essential ecological functions such as wave and storm surge protection, wildlife habitat, nutrient cycling, and sediment trapping.

Prior to the intensive development of the Jamaica Bay watershed, the bay supported an estimated 16,000 acres of saltmarsh (U.S. Fish and Wildlife Service 1997). Initially, saltmarshes of Jamaica Bay were used by settlers as pastureland, which were later filled for development. Large expanses of saltmarsh were used as landfills, some of which were later converted to parks or commercial and residential uses (NYCDEP 2007).

Within this setting, West Pond was constructed in 1954 when a dike was constructed and the Goose Creek Channel was impounded. Gateway National Recreation Area manages West Pond and the surrounding area as a wildlife refuge, the only such designation with the National Park Service (NPS) system. The national recreation area is proposing to repair a breach in the West Pond berm sustained during Hurricane Sandy in October 2012 and restore freshwater habitat.

This statement of findings has been prepared in accordance with Executive Order 11990 (Protection of Wetlands) and NPS Director's Order #77-1.

## **SELECTED ALTERNATIVE**

The (NPS) at Gateway National Recreation Area is planning to address storm damages to West Pond and the trail at Jamaica Bay Wildlife Refuge (refuge) within the Jamaica Bay Unit. The selected alternative will restore West Pond to pre-Hurricane Sandy conditions. Figure 1 presents a conceptual design of the proposed action to repair the breach and improve habitat conditions. The representation of features is presented as conceptual at this stage and the features identified on figure 1 are not to scale.

The primary and secondary breaches at West Pond will be repaired. West Pond and the loop trail will be restored. This selected alternative will also include replacing the water control structure, installation of a groundwater well, and implementation of resource management strategies to improve seasonal use by wildlife. The selected alternative will be implemented in phases, with phase 1 addressing filling and repairing the primary and secondary breaches, replacing the water control structure, installing a groundwater well to provide freshwater to the pond, and restoring the West Pond loop trail. Future phases will include upland habitat restoration at Terrapin Point by thinning vegetation and treating invasive species; shoreline and saltmarsh restoration to increase the ability to withstand adverse impacts from storm events; and installation of other visitor amenities (such as boardwalks, trails, pathways, viewing blinds, and educational signage).

Detailed pond design and planning will be completed prior to implementation. Best management practices as described in appendix 2 of the NPS Procedural Manual #77-1 (NPS 2012) and site specific mitigation measures detailed in attachment D will be implemented.



**Figure 1: Conceptual Representation of the Selected Alternative**

Phase 1 will include in-kind repair of the primary and secondary breach areas of West Pond, in-kind replacement of the water control structure, and in-kind repair the loop trail that surrounds West Pond to restore visitor access as defined in section 4.1.2(g) of the NPS Procedural Manual #77-1 (NPS 2012). In addition, a groundwater well will be installed to supply freshwater to West Pond for wildlife management purposes. Natural replenishment (precipitation and runoff) and the water supply will support freshwater wetland habitat, unique resources for wildlife in the region. There would have been hundreds, if not thousands of acres of brackish wetland systems that would have surrounded the bay prior to European settlement and the development of New York City. Therefore, freshwater will be pumped into West Pond in order to maintain an example of brackish marsh habitat. No habitat restoration activities will occur within the interior of West Pond, as this area will rely on natural recruitment of plant and animal species.

During future phases, visitor amenities such as birding platforms/observation areas, boardwalks, and educational signs will be constructed and in the wetland areas. The boardwalk will require review for compliance with DO 77-1 Wetland Protection prior to construction. In the future, habitat restoration actions will occur within the Terrapin Point upland area. A trail will be constructed around the Point to provide visitor access in this area. Terrapin and tern nesting habitat will be created along the shoreline around Terrapin Point. Habitat restoration will include resource management measures to reduce the shrub layer and the reestablishment of beach habitat along the edge of the western end of the site. Measures to increase resistance against potential future beach erosion from storm damage will include constructing a high salt marsh offshore of the repaired breach. Restoration will include shoreline armoring and high saltmarsh tidal wetlands that will be established along the southern edge of the berm. This compensatory mitigation habitat will create a breakwater to reduce the effects of tidal wave action.

Details of the high marsh restoration (hydrologic restoration, excavation, grading, plantings, etc.) are not available at this conceptual stage of the project. The anticipated schedule for completion has not been clearly defined and therefore, the anticipated timeframe for full function of the saltmarsh wetlands will be dependent upon final design details. Multiple growing seasons will be anticipated before wetlands will be fully functioning. Monitoring and maintenance requirements and schedule will also be determined in follow-on detailed design.

The selected alternative will cause the most short-term impacts to wetlands. The justification for 2.4 acres of wetland impacts centers around the sustainment of freshwater wetland habitat in the west pond, and the enhancement of visitor use experience. Of the 2.4 acres of impacts 2.2 acres are required to fill the primary breach, and 0.2 acres of fill is required to fill the secondary breach. Filling the primary breach will enable the restoration of connectivity to the trail and hydrologically separate the estuary from west pond enabling a freshwater habitat to be created.

A variety of engineered shoreline stabilization options were considered as defensive measures to protect the berm against future storm surge and erosion at the location of the existing primary breach. Options included hardscape, such as cobble, rock toes, cross vanes, rock or concrete sea walls, rip rap, and other types of armoring the shoreline. However, the NPS preferred the proposed shoreline/marsh restoration. This restoration includes the fill in the intertidal zone to restore approximately 5.0 acres of high saltmarsh (saltmarsh cordgrass) outside and south of the primary breach location. The restored marshland will be configured to match the predisturbance size and grade.

This compensatory mitigation habitat will create a breakwater to reduce the effects of tidal wave action. Armoring along the toe of slope will be installed to protect the existing berm from scour and planted with native species. The beach and intertidal area temporarily impacted during construction will be restored with native soils and reseeded with native vegetation. Based on concept drawings the width of the berm and adjacent marshland will be approximately 650 linear feet and 250 feet wide totaling approximately 3.7 acres.

## **ALTERNATIVES CONSIDERED**

Elements of the four alternatives considered to fulfill the proposed action are described in the environmental assessment. Each alternative provides varying measures that contribute to resiliency and sustainability of the project. The alternatives are:

### **Alternative A: No-action Alternative / Continue Current Management**

Under alternative A, no additional measures would be taken to alter the state of the primary or secondary breached areas or the integrity of the berm over time. Natural processes would proceed uninhibited. This alternative would represent a continuation of current actions in the West Pond area without any modifications to water resource conditions, habitat enhancements, or marshland restoration.

### **Alternative B: Repair the Breach and Improve Habitat Conditions, the NPS Preferred Alternative**

Alternative B is the selected alternative. It will be implemented in phases, with phase 1 addressing filling and repairing the primary and secondary breaches, replacing the water control structure, installing a groundwater well to provide freshwater to the pond, and restoring the West Pond loop trail.

A groundwater well will be installed and the water control structure will be replaced to shift the current salinity from an estuarine system (saline) to levels closer to a palustrine system (freshwater), aided by precipitation and surface water runoff contributions from upland areas. This will allow national recreation area staff to manage freshwater levels within West Pond. It will take an estimated 174 days to fill West Pond when considering both natural water inflow from precipitation combined with inflow from groundwater pumping.

Future phases of work will include upland habitat restoration at Terrapin Point, shoreline and saltmarsh restoration to increase resiliency against potential future storm damage, and installation of other visitor amenities (such as boardwalks, trails, pathways, viewing blinds, and educational signage).

### **Alternative C: Create Different Types of Habitat**

Alternative C would entail reconfiguring the site to construct a new berm further inland thereby establishing a smaller, more inland West Pond and converting Terrapin Point into an island. The new configuration would create a mosaic of wetland and upland habitat types to support a diversity of species across the study area. A groundwater well would be installed and the water control structure would be replaced in the vicinity of the reconfigured West Pond to establish freshwater conditions, aided by precipitation and surface water runoff contributions from upland.

It would take an estimated 122 – 139 days to fill West Pond when considering both natural water inflows from precipitation combined with inflow from groundwater pumping.

### **Alternative D: Bridge the Breach**

Under alternative D, the primary breach would be bridged to restore the loop trail around West Pond and the banks of the primary and secondary breaches would be stabilized. Two different structures to span the breach would be considered, a steel truss bridge or a box culvert, both of which would continue to allow for tidal conveyance within West Pond. As a result, salinity levels in West Pond would remain similar to those in Jamaica Bay and wetland conditions and species composition would continue to shift in response.

### **SITE DESCRIPTION**

Jamaica Bay encompasses approximately 13,000 acres ranging from brackish to saline conditions with an average depth of 13 feet and a tidal range of about 4.9 feet. The center of the bay is dominated by sub-tidal open water and extensive low-lying islands composed of saltmarsh, tidal flats, mudflats, and adjacent uplands. The refuge (the Jamaica Bay Unit) spans approximately 9,000 acres, includes the water and islands of Jamaica Bay, two ponds (East Pond and West Pond), trails, and a visitor center (see figures 2 and 3). It is the only wildlife refuge within the National Park System. East Pond (and West Pond prior to Hurricane Sandy) is highly valued in this area as freshwater communities are unique and have largely been lost within Jamaica Bay.

Originally owned and managed by New York City, East Pond, West Pond, and the surrounding landscape were created when Park Commissioner Robert Moses established the two ponds, which lie in the central part of the refuge. The refuge was established in the 1950s by New York City. Ownership of the refuge was transferred to the NPS in 1972 when it was incorporated into Gateway National Recreation Area. The national recreation area provides opportunity for public interpretation, visitor orientation, environmental education, and NPS ranger, maintenance, and other operations. The refuge comprises 9,000 acres of saltmarsh, natural inlets, grassy hassocks, sand dunes, small beaches, and uplands. Much of the refuge is accessible only via water. The refuge is situated along the Atlantic flyway and annually supports hundreds of species of migratory and resident songbirds, shorebirds, and waterfowl. The coastal shoals, bars, and mud flats provide habitat for a number of small mammals and birds.

During Hurricane Sandy, a combination of high tides, wind-blown waves, and the enormous circulation of the superstorm pushed water to a peak surge of nearly 14 feet (NPS 2014a), which damaged the West Pond impoundment. Its amplified wave height and reach, along with strong winds, pushed sand across roads, parking lots, and structures, flooded structures and destroyed machinery, and took beach sands with it as it receded, resulting in a patchwork of coastal erosion and inland areas covered in sand. Although tropical cyclones like Hurricane Sandy primarily flood coastal areas where the storm comes ashore, seasonal storms can cause much wider-ranging damage and major coastal erosion (NPS 2014a).



Figure 2: Gateway National Recreation Area and the Jamaica Bay Wildlife Refuge Map



Figure 3: West Pond Project Area

## **WETLANDS DELINEATION AND IMPACTS**

A wetlands delineation and assessment was completed in May 2014 by wetlands scientists under contract by the NPS. The wetlands delineation was conducted in accordance with the NPS Procedural Manual #77-1: Wetland Protection (NPS 2012) and the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987), Regional Supplement to the Corps Engineers Wetlands Delineation Manual: North Central and Northeast Region (Version 2.0) (U.S. Army Corps of Engineers 2012).

Wetland boundaries were determined by evaluating the presence or absence of wetland indicators at two or more observation points. The boundary was mapped between an observation point evaluated as an upland location and an observation point evaluated as a wetland. Three criteria must be met for an observation point to be considered within a wetland location: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Thirty-four observation points were assessed to delineate the wetlands-upland boundary within the West Pond footprint. Other wetlands located to the east of West Pond within the forested uplands and along the upland-marsh gradient on the western shoreline with Jamaica Bay were also delineated.

Delineated wetlands were characterized using the Cowardin classification system (Cowardin et al. 1979). Under this classification, wetlands may be generally placed into marine (wetlands associated with oceanic environments), riverine (wetlands associated with rivers, streams, and drainage features), estuarine (non-oceanic wetlands influenced by tidal flows), palustrine (freshwater wetland systems), and lacustrine systems (open freshwater systems). Only estuarine wetlands were delineated within the West Pond vicinity, but freshwater wetlands are found in the East Pond vicinity to the east of Cross Bay Boulevard and are expected to be present upon implementation of the preferred alternative. Wetlands were grouped in four distinct areas—Wetlands A, B, C, and D (see figure 4). Table 1 lists the wetlands delineated by Cowardin classification, and figure 4 shows these locations on the map.

**Table 1: Delineated Wetlands within the West Pond Area**

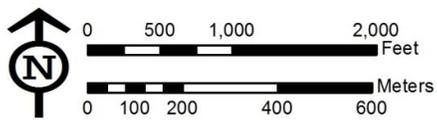
Designation	Cowardin Classification	Description	Size (Acres)
Wetlands A	E1UBL	Subtidal waters within the berm and channel connecting West Pond with Jamaica Bay	45.00
		Subtidal channel connecting West Pond with Jamaica Bay	1.26
	E2EM1N	Emergent marshes and mudflats within West Pond	33.7
	E2SS6P	Estuarine intertidal shrub scrub	9.26
Wetlands B	E2EM1N	Estuarine intertidal emergent marsh regularly flooded within the South Marsh area	7.07
	E2EM1P	Estuarine intertidal marsh with irregular flooding	10.83
	E2US2N	Intertidal sand and mudflats	0.35
Wetlands C	E1UBL	Subtidal waters around North Marsh	20.85
	E2EM1N	Emergent marshes and mudflats within along the North Marsh shoreline	86.35
	E2SS6P	Estuarine intertidal shrub scrub	8.63
Wetlands D	E2EM1N	Emergent marsh regularly flooded surrounding Terrapin Point periphery	0.91
	E2US2M	Mud and sand deposits around Terrapin area	6.86
<b>Total</b>			<b>231.07</b>

Source: Field work and GIS analyses conducted by NPS contractors in May 2014.

Wetland impacts created by the replacement of the water control structure and repair of the primary and secondary breach are excepted actions according to section 4.2.1g of the Procedural Manual #77-1: Wetland Protection.

The wetland delineation defined 231.2 acres of wetlands. The existing wetlands present by Cowardin Classification are depicted in figure 5. After implementation of the preferred alternative, it is estimated that 235.7 acres of wetlands would be present (see figure 6). The estimated change in acreage of wetland from the preferred alternative is represented in table 1. Repairing the breach will fill conveyance with approximately 0.35 acre of open water and mud flats and will accommodate a mean high water elevation of 3 feet (0.9 m) (see figure 7). The potential secondary breach location will require approximately 0.08 acres of fill within upland areas and potential temporary disturbance of mudflats and emergent wetland. Replacement of the water control structure will require construction access through intertidal sand and mudflat wetlands. Installation of the water control structure will temporarily disturb approximately 0.15 acres of mudflat and emergent wetland during construction.

These estimates have been based solely on a conceptual design and final engineering plans have not been completed.

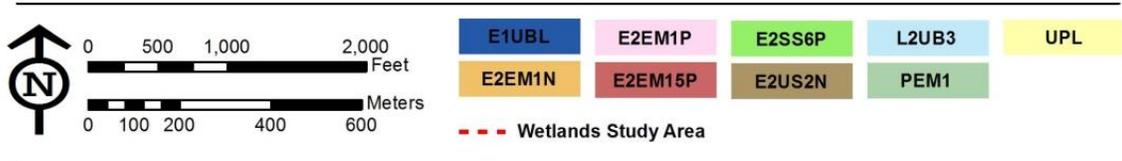


- Observation Point
- - - Wetlands Study Area
- Wetlands A - West Pond
- Wetlands B - South Marsh
- Wetlands C - North Marsh
- Wetlands D - Terrapin Point
- Upland

Figure 4: Wetland Areas within the West Pond Area



Figure 5: Existing Classifications within the West Pond Area



**Figure 6: Estimated Wetland Classifications within the West Pond Area Following Implementation of Alternative B**

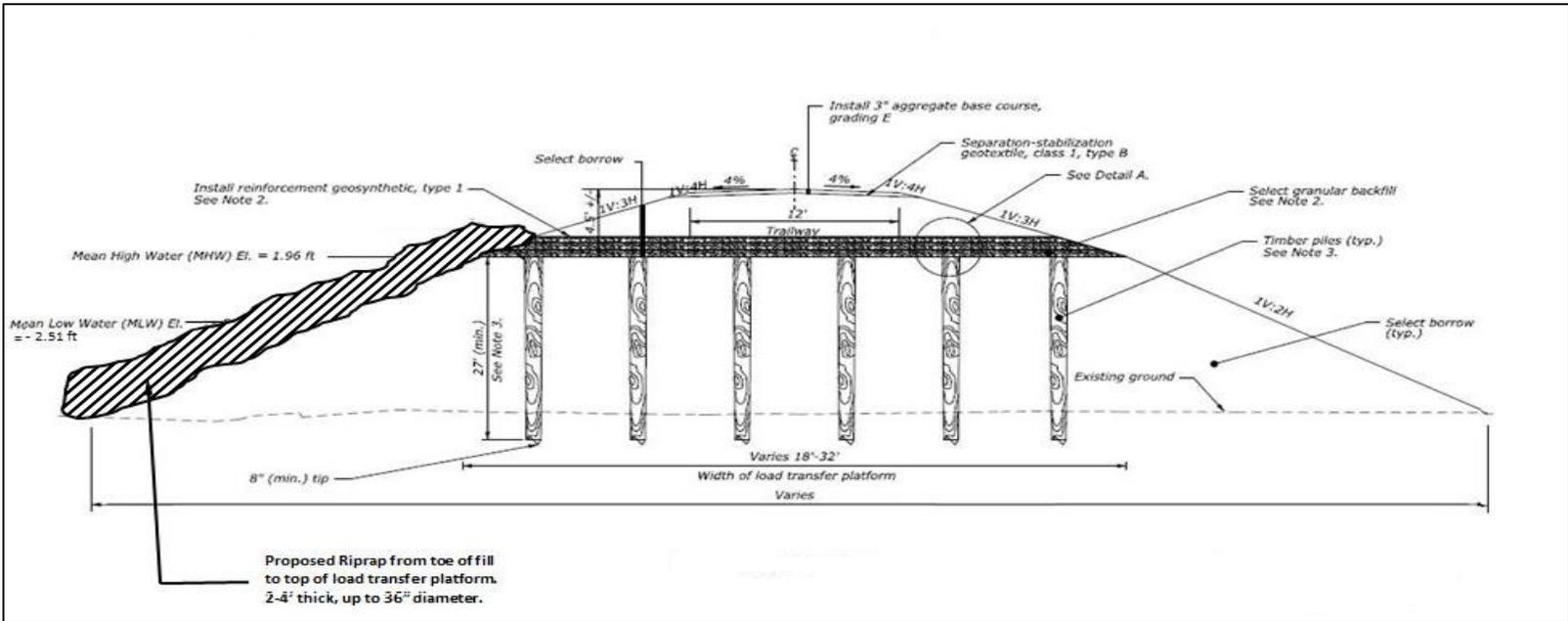


Figure 7: Mean High and Low Water Elevations Depicted on the Proposed Primary Breach Embankment Repair  
(Source: FHWA 2015)

The selected alternative will include restoration efforts to establish approximately 5.0 acres of high saltmarsh (saltmarsh cordgrass) outside and south of the primary breach location, as well as 3.7 acres of shoreline habitat. These restoration actions will further protect the berm from future erosion. The existing estuarine wetlands found inside the berm will be isolated from tidal flow through the breach once the breach was repaired. The addition of a groundwater well for freshwater supply to West Pond will cause the area to shift from estuarine, tidally influenced habitat to freshwater habitat. This change can be seen in table 1 and figure 6 with the addition of palustrine and lacustrine wetlands and the loss of estuarine wetlands inside the berm.

## **FUNCTIONAL ANALYSIS**

### **Overview of the Evaluation of Planned Wetlands Functional Analysis Technique**

For the purposes of evaluating the loss or gain of wetlands functions, NPS contractors selected the evaluation of planned wetlands (EPW) technique (Bartoldus et al. 1994). EPW is a rapid functional assessment method used by regulatory stakeholders in the Jamaica Bay watershed and was therefore used to assess wetlands functions at West Pond. Wetland functions assessed in this procedure included: shoreline bank and erosion control (SB), sediment stabilization (SS), water quality (WQ), wildlife (WL), and uniqueness/heritage (UH) (see table 2).

Several elements were considered for each of the functions analyzed following the EPW technique. An element is a physical, chemical, or biological characteristic of the wetland or landscape that dominates the capacity of the wetland to perform a function. For each assessment area, multiple elements were evaluated. This is one of the strengths of the EPW approach, in that it allows the reviewer to identify important elements in assigning a functional capacity index (FCI) for a particular function.

The FCI is identified in the EPW procedure as a dimensionless expression of the varying capacity of wetlands to perform a given function. The FCI ranges from 0.0 to 1.0, where 0.0 represents no functional capacity and 1.0 represents optimum functional capacity. A score of "NA" may also be assigned, indicating that a particular function is not applicable for the wetland assessed. The FCI for a given function (e.g., SB, SS, WQ, WL, UH) is derived from an assessment model that combines element scores based on the relationship between the various elements and the function itself. By multiplying the area (in acres) with the FCI, the functional capacity unit (FCU) is calculated, which provides the cross-functional comparison values to determine what functions are gained or lost from the proposed activity.

**Table 2: Functional Descriptions and Applications**

Function	Code	Definition	Application and Notional FCI Values
Shoreline bank erosion	SB	Capacity to provide erosion control and to dissipate erosive forces at a shoreline bank	The selected alternative will increase erosion control and dissipate forces along the exposed shoreline bank. Therefore, existing conditions will be scored at 0, and the proposed action will be scored at 1.
Sediment stabilization	SS	Capacity to stabilize and retain previously deposited sediments	Sediments deposited in West Pond over the years would continue to flow with tides out of West Pond if the breach remained open under the no action alternative. TSS will score high under the selected alternative with the breach repaired, and low under the no action alternative.
Water quality	WQ	Capacity to retain and process dissolved or particulate materials down current within Jamaica Bay	Repairing the breach will exclude the area of West Pond from providing ecosystem services for Jamaica Bay. Therefore, the selected alternative will score low at 0 by repairing the breach, and the selected alternative will allow inflows for nutrient cycling and score higher (toward 1, depending on the design).
Wildlife	WL	Degree to which a wetland functions as habitat for wildlife as described by habitat complexity	The selected alternative will restore habitat diversity and therefore score above 0.5.
Fish	FT	Tidal fish: degree to which a wetland habitat meets the food/cover, reproductive, and water quality requirements of fish	The selected alternative will repair the breach and score zero, the no action alternative would score higher, depending on the amount of estuarine water available for tidal fish.
	FP	Non-tidal pond fish: degree to which a wetland habitat meets the food/cover, reproductive, and water quality requirements of fish	The selected alternative will repair the breach and would score higher at 1.
Uniqueness / heritage	UH	Presence of characteristics that distinguish a wetland as unique, rare, or valuable	The selected alternative will diversify habitats and therefore score at or near 1. The no action alternative would maintain the breach and score at zero because the habitats would resemble the rest of the wetlands complex within Jamaica Bay.

**Functional Analysis for the NPS Preferred Alternative**

Four wetland assessment areas were used to properly compare functions for all the alternatives analyzed in the environmental assessment. These areas included the inner portion of West Pond, three areas on the bayside of the berm that support low saltmarshes, tidal creeks, beach habitats, and mudflats. This statement of findings includes the functional assessment for the repair the breach and improve habitat conditions alternative in the environmental assessment, which only occur within “Wetlands A / West Pond WAA.” Table 3 show the functional assessment comparison to existing conditions and the selected alternative within Wetlands A / West Pond WAA.

As shown in table 3, functional values of the selected alternative increase wetland functions across all functional areas, with the exception of tidal fish. This is because repairing the breach will lose this functional capacity for tidal fish, but will replace it by providing habitat for freshwater fish.

**Table 3: Functional Descriptions and Applications**

Function	Code	Existing Conditions		Repair the Breach		Gain / Loss of Wetlands Functions by FCU
		FCI	FCU	FCI	FCU	
Shoreline bank erosion	SB	0.265	7.732	0.807	23.498	<i>15.767</i>
Sediment stabilization	SS	0.410	0.398	0.919	0.891	<i>0.493</i>
Water quality	WQ	0.753	21.920	0.868	25.295	<i>3.374</i>
Wildlife	WL	0.845	24.609	0.944	27.491	<i>2.883</i>
Fish	FT	0.518	15.099	0	0	<i>-15.099</i>
	FP	0	0	0.758	22.081	<i>22.081</i>
Uniqueness / heritage	UH	0.571	16.646	0.857	24.969	<i>8.323</i>

**JUSTIFICATION OF THE PREFERRED ALTERNATIVE FOR USE OF WETLANDS**

This project will reestablish West Pond to freshwater habitat, which has become rare in the region. Freshwater habitat has largely been replaced within the Jamaica Bay watershed by urban development. The purpose of this project is to provide a solution to future erosion of the berm and damage to the trail while enhancing visitor experiences within the West Pond trail area that supports a diversity of Jamaica Bay habitats and wildlife. The proposed project is needed for the following reasons:

Conditions in the area around the breach and the portion of West Pond loop trail that previously crossed the embankment (berm) are not currently safe for public access and.

The existing breached condition is vulnerable to reoccurring storm activity and susceptible to future damage from erosion.

Opportunities for universal access by visitors from near and far to the West Pond loop trail to view wildlife, enjoy the bay, and learn about the resources are limited.

The refuge does not currently provide brackish habitat that supports a diversity of species in an environment that has the ability to withstand adverse impacts from storm events.

The Jamaica Bay Unit of Gateway National Recreation Area is one of the largest expanses of open space in the region, consisting of over 19,000 acres of land, bay, and ocean waters within two boroughs of New York City: Brooklyn and Queens. Special mandates in the national recreation area’s enabling legislation include conservation and management of wildlife and natural resources in the Jamaica Bay Unit. This mandate states that the Secretary shall administer and protect the islands and waters within the Jamaica Bay Unit with the primary aim of conserving the natural resources, fish, and wildlife located therein and shall permit no development or use of this area, which is incompatible with this purpose.

Repairing the breach, and maintaining freshwater would have beneficial impacts to freshwater wetlands and the species that depend on these habitat conditions. These freshwater communities are unique and have largely been lost within Jamaica Bay.

## **MITIGATION**

Wetland impacts created by the replacement of the water control structure and repair of the breaches are excepted actions according to section 4.2.1g of the Procedural Manual #77-1: Wetland Protection. Therefore, the best management practices and conditions described in appendix 2 of the manual have been met or will be implemented, and wetland compensation is not required for these actions.

The shoreline armoring along the southern edge of the West Pond area (labeled shoreline restoration) will fill approximately 3.7 acres of intertidal wetland. The creation of approximately 5.0 acres of high salt marsh, to be located adjacent to the armoring, will compensate for the loss of 3.7 acres of intertidal habitat created by the armoring fill for a net gain of 1.3 acres of high marsh habitat.

## **SUMMARY**

The NPS finds that the repair of the breached berm at West Pond and associated enhancements and management actions to restore habitats within West Pond are essential for fulfilling the mission of the refuge. Further, the selected alternative will increase functional values of essential wetlands functions. This project is consistent with the policies and procedures of NPS Director's Order #77-1 (Protection of Wetlands) and Executive Order 11990.

## **REFERENCES**

Bartoldus, C.C., E.W. Garbisch, and M.L. Kraus

1994 Evaluation for Planned Wetlands (EPW). Environmental Concern Inc. St. Michaels, MD.

Cowardin, L. M., V. Carter, F. C. Golet, & E. T. LaRoe

1979 Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, Washington, D.C. FWS/OBS-79/31.

National Park Service (NPS)

2012 Procedural manual #77-1: Wetland protection.

2014 *A New Vision for a Great Urban National Park Gateway National Recreation Area Final General Management Plan / Environmental Impact Statement*. April.

New York City Department of Environmental Protection

2007 *Jamaica Bay Watershed Protection Plan*. Volume 1. October 1, 2007.

U.S. Army Corps of Engineers (USACE)

2010 Regional supplement to the Corps of Engineers wetland delineation manual: Western mountains, valleys, and coast region (Version 2.0). U.S. Army Corps of Engineers Environmental Laboratory Report ERDC/EL TR-10-3.

**ATTACHMENT G**

**FINAL FLOODPLAIN STATEMENT OF FINDINGS**

FINAL FLOODPLAIN STATEMENT OF FINDINGS

Jamaica Bay Wildlife Refuge West Pond Trail Breach Repair  
Gateway National Recreation Area  
Jamaica Bay Unit  
Jamaica Bay Wildlife Refuge

**Recommended:**

  
\_\_\_\_\_  
Jennifer T. Nersesian, Superintendent, Gateway National Recreation Area      Date 1-15-16

**Certified for Technical Accuracy and Servicewide Consistency:**

  
\_\_\_\_\_  
T. Edwin Hamer      Date 1/19/2016  
Chief, Water Resources Division

**Approved:**

  
\_\_\_\_\_  
Michael A. Caldwell, Regional Director, Northeast Region      Date 2/8/16

## **INTRODUCTION**

Jamaica Bay is one of the largest coastal wetland ecosystems in the region and is part of a series of tidal estuaries extending along the Atlantic coast. The rich biodiversity that characterizes the Jamaica Bay ecosystem is derived from a mosaic of estuarine features-- open water, mud flats, low and high saltmarshes and intertidal beaches with small areas of freshwater wetlands in adjacent upland habitats. These wetlands are interfaces between the open water and land, and serve many essential ecological functions such as wave and storm surge protection, wildlife habitat, nutrient cycling, and sediment trapping.

Prior to the intensive development of the Jamaica Bay watershed, the bay supported an estimated 16,000 acres of saltmarsh. Initially, saltmarshes of Jamaica Bay were used by settlers as pastureland, which were later filled for development. Large expanses of saltmarsh were used as landfills, some of which were later converted to parks or commercial and residential uses.

Within this setting, West Pond was constructed in 1954 when a dike was constructed and the Goose Creek Channel was impounded. West Pond is located at Jamaica Bay Wildlife Refuge (refuge) within the Jamaica Bay Unit of Gateway National Recreation Area. The NPS manages West Pond and the surrounding area as a wildlife refuge, the only such designation with the National Park Service (NPS) system. The national recreation area is planning to repair a breach in the West Pond berm sustained during Hurricane Sandy in October 2012 and restore freshwater habitat.

This statement of findings has been prepared in accordance with Executive Order 11988 (Floodplain Management), NPS Director's Order #77-2, and Floodplain Management and Procedural Manual #77-2. The statement of findings summarizes the floodplain development associated with actions to repair a breach in the West Pond berm and restore freshwater habitat in West Pond. The national recreation area and West Pond project location are shown on figures 1 and 2. The statement of findings also describes the reasons why encroachment into the floodplain is required to implement the project, the site-specific flood risks involved, and the measures that will be taken to mitigate floodplain impacts.

### **Brief Description of the Proposed Action**

The selected alternative emphasizes repair of the primary and secondary breaches and the subsequent restoration of West Pond and the loop trail. A groundwater well will be installed and the water control structure replaced to shift the current salinity from an estuarine system (saline) to levels closer to a palustrine system (freshwater), aided by precipitation and surface water runoff contributions from upland areas. This alternative includes replacement of the water control structure and use of best management practices to improve seasonal use by wildlife and opportunities for recreation and interpretive activities. The selected alternative will be implemented in phases, with phase 1 addressing filling and repairing the primary and secondary breaches, replacing the water control structure, installing a groundwater well to provide freshwater to the pond, and restoring the West Pond loop trail. Future phases will include upland habitat restoration at Terrapin Point; shoreline restoration, saltmarsh restoration; and installation of other visitor amenities (such as boardwalks, trails, pathways, viewing blinds, and educational signage). In addition to maintaining the berm and repairing the primary and secondary breached areas, shoreline habitat and salt marsh restoration outside the primary breach will serve as an additional measure to increase

resiliency against potential future storm damage. This habitat will create a breakwater to reduce the effects of tidal wave action.



Figure 1: Gateway National Recreation Area and the Jamaica Bay Wildlife Refuge Map



Figure 2: West Pond Project Area

## **Brief Site Description**

Gateway National Recreation Area, established in 1972, consists of three administrative units: Staten Island, Sandy Hook, and Jamaica Bay. The refuge is located within the Jamaica Bay Unit. The Jamaica Bay Unit includes West Pond and is one of the largest expanses of open space in the region, consisting of over 19,000 acres of land, bay, and ocean waters within the densely populated and urban areas of Brooklyn and Queens, New York.

This entire area is located within the Jamaica Bay watershed. The Jamaica Bay watershed is located at the southwestern tip of Long Island. It falls within the broader Atlantic Ocean/Long Island Sound watershed, which consists of approximately 91,000 acres (142 square miles) and includes portions of Brooklyn, Queens, and Nassau County, New York. Jamaica Bay itself encompasses approximately 13,000 acres ranging from brackish to saline conditions with an average depth of 13 feet and a tidal range of about 4.9 feet. The center of the bay is dominated by sub-tidal open water and extensive low-lying islands composed of saltmarsh, tidal flats, mudflats, and adjacent uplands.

Within Jamaica Bay, the refuge encompasses approximately 9,000 acres that include the bay itself, several island, two brackish ponds (East Pond and West Pond –now breached), trails, and a visitor center. The refuge is composed of saltmarsh, natural inlets, grassy hassocks, sand dunes, small beaches, and upland habitats. It is located along the Atlantic flyway and is a significant bird sanctuary with sightings of over 300 species of songbirds, shorebirds, and waterfowl over the last 30 years. The shoals, bars, and mud flats provide habitat for a number of small mammals, reptiles, and amphibians. The refuge provides opportunities for recreation, scenic vistas, birding, visitor orientation, environmental education, national recreation area maintenance, and ranger operations.

The study area includes West Pond and the surrounding area west of the visitor center. The West Pond area is largely undeveloped. Facilities in the study area include trails around West Pond, a visitor center, gardens, and viewing areas with benches. West Pond was approximately 44 acres and approximately 3 to 4 feet deep prior to Hurricane Sandy. West Pond was breached during Hurricane Sandy, allowing waters from Jamaica Bay to flow unabated into the pond thereby changing habitat conditions in and around the pond. The east and west banks of the breach continue to erode with tidal and storm activity.

Originally owned and managed by New York City, East Pond, West Pond, and the surrounding landscape were created when Park Commissioner Robert Moses established the two ponds. The Jamaica Bay Bird Sanctuary was established in the 1950s by New York City, and was renamed Jamaica Bay Wildlife Refuge in 1972 when it was incorporated into the national recreation area under NPS administration.

## **General Characterization of Floodplain Values and of the Nature of Flooding and Associated Floodplain Processes in the Area**

Jamaica Bay is one of the largest coastal wetland ecosystems in the region and is part of a series of tidal estuaries extending along the Atlantic coast. The rich biodiversity that characterizes the Jamaica Bay ecosystem is derived from a mosaic of estuarine features--open water, mud flats, low and high saltmarshes and intertidal beaches with freshwater wetlands in adjacent upland habitats. These wetlands are interfaces between the open water and land, and serve many essential ecological functions such as wave and storm surge protection, wildlife habitat, nutrient cycling, and sediment trapping.

However, large expanses of saltmarsh were used as landfills, some of which were later converted to parks or commercial and residential uses. Human disturbances, including these and other historical land uses, dredge and fill activities of the bay (including East and West Ponds) and marshes, hard-edged constructed shorelines, ongoing urban development have changed the nature and functionality of the floodplain in the project area. The project area is located within the Coastal Barrier Resources System. As defined by the Coastal Barrier Resources Act, an "undeveloped coastal barrier" is a "depositional geologic feature that is subject to wave, tidal and wind energies; and protects landward aquatic habitats from direct wave attack".

## **JUSTIFICATION FOR USE OF THE FLOODPLAIN**

### **A. Description of Why the Proposed Action Must be Located in the Floodplain**

This project will reestablish West Pond to freshwater habitat, which has become rare in the region. Freshwater habitat has largely been replaced within the Jamaica Bay watershed by urban development. West Pond and the surrounding area are located entirely within the 100-year floodplain and as such is the only practicable location for the proposed action. The purpose of this project is to provide a solution to future erosion of the berm and damage to the trail while enhancing visitor experiences within the West Pond trail area that supports a diversity of Jamaica Bay habitats and wildlife. The proposed project is needed for the following reasons:

- Conditions in the area around the breach and the portion of West Pond loop trail that previously crossed the embankment (berm) are not currently safe for public access.
- The existing breached condition is vulnerable to reoccurring storm activity and susceptible to future damage from erosion.
- Opportunities for universal access by visitors from near and far to the West Pond loop trail to view wildlife, enjoy the bay, and learn about the resources are limited.
- The refuge does not currently provide habitat that supports a diversity of species in an environment that is resilient to erosion from storms by sustainable means.

The Jamaica Bay Unit of Gateway National Recreation Area is one of the largest expanses of open space in the region, consisting of over 19,000 acres of land, bay, and ocean waters within two boroughs of New York City: Brooklyn and Queens. Special mandates in the national recreation area's enabling legislation include conservation and management of wildlife and natural resources in the Jamaica Bay Unit. This mandate states that the Secretary shall administer and protect the islands and waters within the Jamaica Bay Unit with the primary aim of conserving the natural resources, fish, and wildlife located therein and shall permit no development or use of this area, which is incompatible with this purpose. Repairing the breach and maintaining freshwater would have beneficial impacts to vegetation, the species that depend on these habitat conditions, wetland habitats, and floodplains values.

During the Hurricane, West Pond, which comprises approximately 44 acres and is approximately 3 to 4 feet deep, was fully breached at the southeast corner and a potential secondary breach is likely along the southwestern edge of the pond. The resulting seawater inundation has increased the salinity, created tidally influenced conditions, and changed

habitat composition within the pond. West Pond trail along the top of the berm of the pond was breached and other portions of the trail were damaged.

## **B. Investigation of Alternative Sites**

Because the purpose of the project is to provide for environmentally sensitive and resilient conditions and enhanced visitor experiences within the West Pond trail area that support a diversity of Jamaica Bay habitats and wildlife, there is no practicable alternative to undertaking this particular action outside the floodplain in an alternative location. The efforts undertaken under the selected alternative will benefit the floodplain once restoration efforts are completed, installation of living shoreline and saltmarsh efforts outside the berm are completed, established, and able to function by absorbing storm energy and storing water.

## **DESCRIPTION OF SITE-SPECIFIC FLOOD RISK**

### **A. Recurrence Interval of Flooding at the Site**

The Federal Emergency Management Agency maps flood hazard areas, which are locations on the landscape with a greater than 1% chance of flooding within any given year. After Hurricane Sandy, flood zone maps, known as flood insurance rate maps (FIRMs) were revised and preliminary maps made available to the public on December 5, 2013. The Federal Emergency Management Agency released revised maps in January 2015 (see figure 3). These maps show the entire West Pond area within the 100-year floodplain, with the exception of an upland area on Terrapin Point and the area along Cross Bay Boulevard encompassing the visitor's center. The outer areas that include low marshes are considered to be within the coastal flood zone with a "wave action velocity hazard." Base flood elevations within these areas range from 12 to 13 feet. Relatively more protected flood zone areas without the velocity hazard have base flood elevations at 11 feet (FEMA 2015).

In 2013, the U.S. Fish and Wildlife Service updated maps produced through the Coastal Barrier Resources System (CBRS), originally produced in the 1980s. The comprehensive revision of maps along the Atlantic coast is intended to assist federal agencies' compliance with the Coastal Barriers Resources Act. This legislation, signed into law in 1982, designated relatively undeveloped coastal barriers as part of the CBRS, and made these areas ineligible for most new federal expenditures and assistance. West Pond was added to the CBRS in 1991 (FEMA 2015).

### **B. Hydraulics of Flooding at the Site (Depths, Velocities)**

During Hurricane Sandy, a combination of high tides, wind-blown waves, and the enormous circulation of the superstorm pushed water to a peak surge of nearly 14 feet (NPS 2014). Its amplified wave height and reach, along with strong winds, pushed sand across roads, parking lots, and structures, flooded structures and destroyed machinery, and took beach sands with it as it receded, resulting in a patchwork of coastal erosion and inland areas covered in sand. Although tropical cyclones like Hurricane Sandy primarily flood coastal areas where the storm comes ashore, seasonal storms can cause much wider-ranging damage and major coastal erosion (NPS 2014).

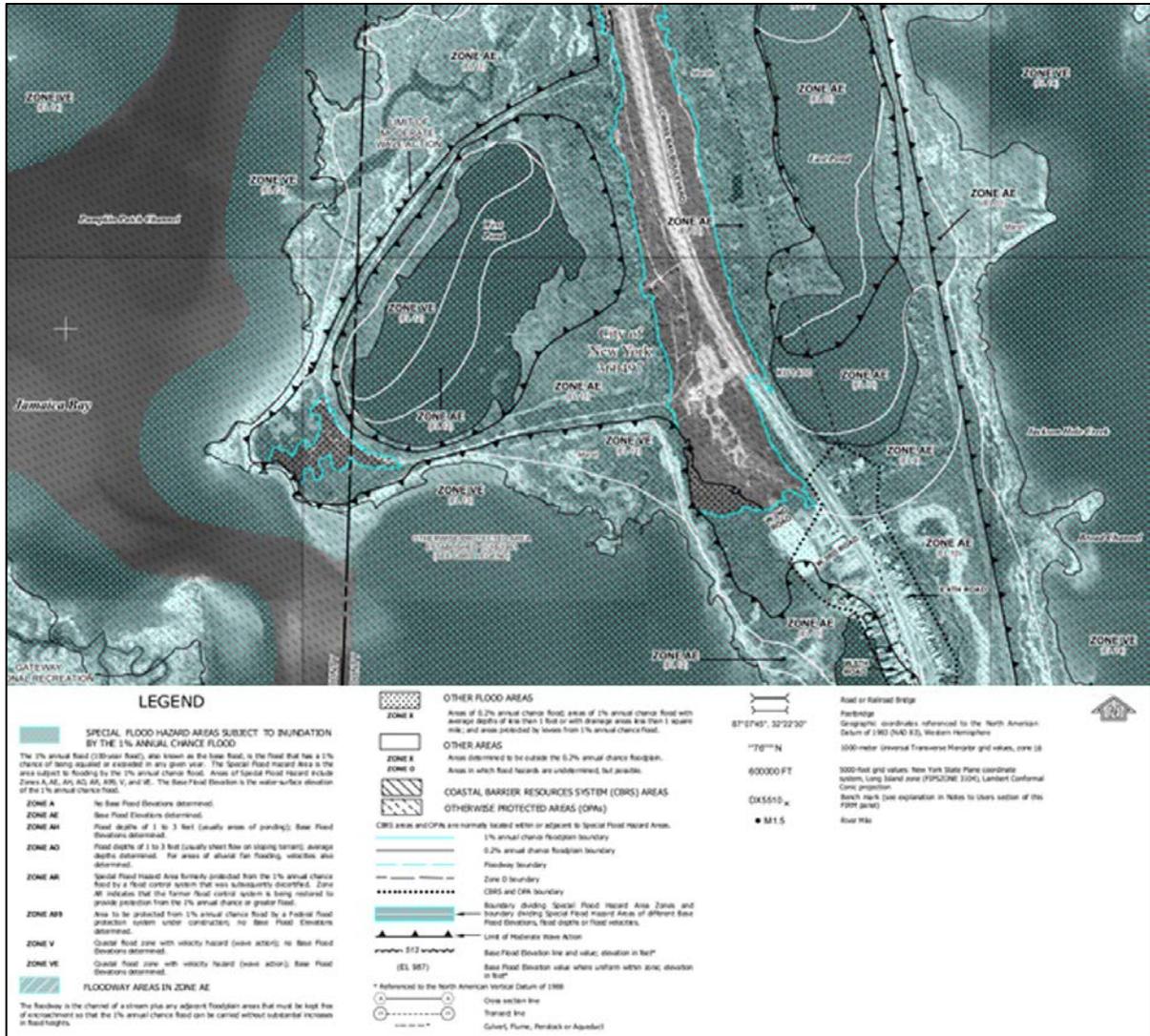


Figure 3: FEMA Flood Insurance Rate Map 3604970377G – Revised January 30, 2015

### **C. Time Required for Flooding to Occur (Amount of Warning Time Possible)**

The berm surrounding West Pond does not have much vertical relief; roughly a 6-7 foot elevation above mean sea level and the majority of the Pond is protected by wetlands providing valuable water storage. Flooding generally occurs in the project area as a result of storm surge, making storm and marine warnings a practical option for protection of human life. Flash flooding is not likely in this area.

### **D. Opportunity for Evacuation of Site in the Event of Flooding**

Evacuation of West Pond once weather and marine warnings are issued will occur via actions taken at the refuge visitor center. Circling West Pond is a trail leading to the visitor center parking area lot located off Cross Bay Boulevard. The NPS will close the parking lot to visitors as necessary and appropriate. Cross Bay Boulevard is a median-divided boulevard connecting Rockaway Peninsula to Queens. This road is one of three hurricane evacuation routes for the residents of the Rockaway Peninsula. It is also served by Metropolitan Transportation Lines bus routes.

### **E. Geomorphic Considerations (Erosion, Sediment Deposition, Channel Adjustments)**

Flooding in the area of West Pond can range from minor overwash events from high tides to major flooding from hurricanes and other coastal storms. Excessive precipitation can also flood low elevation areas across the floodplain. Major storms can drive ocean storm surges completely across Jamaica Bay, dramatically changing habitats as well as the entire landscape. As storm winds and waves scour away sand and sediments from one location, they are deposited in new areas as coastal dynamics can reform the area. Storm surge combined with a high tide can breach the islands and create new inlets. As demonstrated by Hurricane Sandy in 2012, Jamaica Bay is extremely vulnerable to coastal flood events. Scouring and soil erosion of the inlet walls is occurring at the breach location and it is widening the breach. Eroding soils and sediments have been transported through the breach into the pond and out into the bay where they are settling and creating shoals. However, the area supports a number of natural features that reduce flooding severity. For example, estuarine wetlands along the shoreline provide various functions, such as flood flow storage and sediment retention.

## **DESCRIPTION AND EXPLANATION OF FLOOD MITIGATION PLANS**

Under the selected alternative, West Pond will be repaired similar to pre-Hurricane Sandy conditions. These actions will have beneficial impacts on floodplains because the berm will be replaced, which will provide protection from storm surges, decrease fetch, and better protect facilities. This action will increase protections for people and structures by decreasing fetch, thereby decreasing the potential for storm surge to reach permanent infrastructure (e.g., the visitor center). The selected alternative will also have beneficial effects on wetlands because the repaired breaches will protect wetlands inside the berm from wave action and the enable park staff additional capacity to manage the hydrology within West Pond to improve wetland and floodplain function.

The selected alternative will include restoration efforts to establish high saltmarsh vegetation (e.g., saltmarsh cordgrass) outside the primary breach location, as well as provide resiliency measures to further protect the berm from future erosion. These resiliency measures to protect the berm will include the restoration of an estimated 5 acres of high salt marsh within the subtidal estuarine areas outside of the berm. These estimates have been based solely on a conceptual design and final engineering plans have not been completed.

The existing estuarine wetlands found inside the West Pond berm will be isolated from tidal influence once the primary and secondary breaches are repaired. The addition of a groundwater well for freshwater supply to West Pond will cause the area to shift from estuarine, tidally influenced habitat to freshwater habitat. These efforts are designed to dissipate water energy and flows, encourage deposition of sediment, and create freshwater habitat. Filling the breach and stabilizing the banks, and restoring vegetation will mitigate flood impacts because root systems will stabilize soils and sediments by anchoring them vertically and laterally in both wetland and upland habitats. These efforts will make soils and sediments less vulnerable to erosion and storm impacts because they have been bound and retained within the roots of the vegetation. This will slow the erosion of exposed areas, accelerate the process of soil and sediment recovery, and create a more stable configuration.

**A. Measures to Reduce Hazards to Human Life and Property to the Regulatory Floodplain Level, while minimizing the impact to the Natural Resources of the Floodplain, Including the Use of Non-structural Measures as Much as Practicable**

Conditions associated with flooding at this location are not considered particularly hazardous to people or property. Flooding generally occurs in the project area as a result of storm surge, making weather/marine warnings and evacuation a practical option for protection of human life.

**B. Acknowledgement that Structures and Facilities are Designed to be Consistent with the Intent of the Standards and Criteria of the National Flood Insurance Program (44 CFR Part 60).**

The NPS will ensure that the final engineering designs are approved and the project will receive all necessary permits from those governmental agencies from which approval is required by Federal or State law. These permits will ensure consistency with 44 CFR Part 60.

**SUMMARY**

A statement of findings is prepared if the action falls within the defined regulatory floodplain:

- Class I includes the location or construction of administrative, residential, warehouse and maintenance buildings, non-excepted parking lots or other man-made features, which by their nature entice or require individuals to occupy the site, are prone to flood damage, or result in impacts to natural floodplain values. Actions in this class are subject to the floodplain policies and procedures if they lie within the 100-year regulatory floodplain (the Base Floodplain).

- Class II includes “critical actions”—those activities for which even a slight chance of flooding would be too great. Examples of critical actions include schools, hospitals, fuel storage facilities, irreplaceable records, museums, and storage of archeological artifacts. Actions in this class are subject to the floodplain policies and procedures if they lie within the 500-year regulatory floodplain.
- Class III includes all Class I or Class II actions that are located in High Hazard Areas, including coastal high hazard areas and areas subject to flash flooding. Actions in this class are subject to the floodplain policies and procedures if they lie within the Extreme Flood regulatory floodplain.

In accordance with NPS Procedural Manual 77-2 (Floodplain Management), the repair and restoration activities under the selected alternative is a “Class III” action. These actions include activities that require construction within flood prone areas, but exclude infrastructure that are permanently occupied. Class III actions allow for trails, viewing platforms, and picnic and rest areas, with appropriate signage to warn visitors of flood hazards.

The NPS finds that the repair of the breached berm at West Pond and freshwater control structures and groundwater supply and management actions to maintain habitats within West Pond are essential for public use and safety, despite the fact that the actions will be located in flood-prone areas. The NPS also finds that in repairing the berm, there are no practicable alternatives to enhance resiliency outside of the floodplain since the entire West Pond is within the 100-year floodplain. This project is consistent with the policies and procedures of NPS Director’s Order #77-2 (Floodplain Management) and Executive Order 11988.

## REFERENCES

### Federal Emergency Management Agency (FEMA)

- 2015 Flood Insurance Rate Map, City of New York, New York. Panel 377 of 457. Map Number 3604970377G. Revised Preliminary Map, Released January 30, 2015.

### National Park Service (NPS)

- 2003 Director’s Order #77-2: Floodplains Management. Washington, DC: NPS Office of Policy. Approved September 8, 2003.
- 2014 *A New Vision for a Great Urban National Park Gateway National Recreation Area Final General Management Plan / Environmental Impact Statement*. April.

### New York City Department of Environmental Protection

- 2007 *Jamaica Bay Watershed Protection Plan*. Volume 1. October 1, 2007.